Information Industry Literacy within the New Millennium:
A Case Study of a Developing Country—Egypt

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Abstract

Information Literacy is a concept that does not just apply to individuals. It has considerable significance and relevance to institutions, and to all sectors of society. There is a general presumption, a fair one I believe, that if all sectors of a nation's society become more information literate, then the economy of the country, the quality of public policy decisions, and the quality of life of all individuals will improve concomitantly. This paper addresses information literacy as the author understands its applicability and relevance to the business and industry sector. Hence the paper's title "Information Industry Literacy," which can be translated as "the significance and importance of the information literacy concept to business and industry." That does not necessarily infer that commercial or for-profit firms, alone, should be the only component targets of information industry literacy improvements. Other "players" that are involved in the classic production-consumption economic model must also be involved, including the information literacy of consumers, the information literacy of raw material suppliers, of intermediary distributors, of government regulators, and so on. In short, not just the information literacy of the manufacturer. This paper's perspective is that of a businessman who has been intimately involved in information literacy improvements in one developing country, his native land, Egypt. The particular significance of the reopening in 2002, after centuries of dormancy, of the Library of Alexandria (Bibliotheca Alexandrina) in a worldwide information literacy context is also addressed. The working definition of information literacy provided by the Information Literacy Meeting of Experts convenors has been accepted by this author and the term is used in the paper with the meaning ascribed by that definition. From time to time suggestions for strengthening that working definition are made.

INTRODUCTION

This paper is organized into eleven sections:

First, a Brief *Background and Context* section introduces the subject of information industry literacy into the Egyptian setting, using a very broad brush, and sweeping strokes onto the canvas.

Second, a *Some Background Useful Baseline Facts and Figures About Egypt* section provides some overall key national statistics, including demographic, economic, social, and cultural facts and figures so as to familiarize the reader with the key elements of Egyptian society and the Egyptian economy.

Third, the *Egyptian National Information Infrastructure* section begins to zero-in on the key components of the Egyptian information and communications foundations - - the hardware components, the software components, human resources, physical resources, and so forth, and how they are all interconnected and how they interoperate.

Fourth, the key role played by the *Education and Research* sector is examined, focusing on the dramatic shifts from the more traditional modes of teaching and learning to the newer modes, including distance learning and distance education.

Fifth, the *Changing Role of Information Organizations in Egypt* is reviewed, concentrating on how and why new institutions are being created, and older ones are being reformed or in some cases abandoned.

Sixth the *Impacts of the Internet Age on Egyptian Society* are examined.

Seventh, the *Library and Publishing Industry in Egypt* section focuses on the recent challenges of the national libraries, The National Bibliography of Egypt (NBE) and the revival of Public Libraries in Egypt.

Eighth, the "*Role of the bibliotheca Alexandrina in world Information Literacy*" examines the special role of the revived *Library of Alexandria*, formally called the "*Alexandrina Bibliotheca*," as a key world information literacy institution, not just in Egypt, nor just in the Arab and Muslim World, but internationally.

Ninth, *Results and Conclusions* – the final substantive section of the paper, which endeavors to summarize the major findings, and point to the future needs of the country, within the boundaries of the paper's information industry literacy context.

Tenth. *Footnotes* – the bibliographic references referred to in the paper.

Eleventh, *Additional Readings* – Additional materials to which the reader is referred, but which are not directly cited in the paper itself.

1. BRIEF BACKGROUND AND CONTEXT

The Ninteenth and Twentieth Centuries were marked worldwide by:

- the granting of very substantial numbers of patents, copyrights, and trademarks for modern information and communications technologies and products, the production of those products, and their spread throughout society;

- the appearance of giant multi-national companies mass-producing these machine-assisted information products and services, many of which incorporated sophisticated artificial intelligence (AI) components; and

- the proliferation of many small and medium-sized entreprenurial organizations which participated in, and often played a strategic role in what has often (but not universally) come to be called in the 1960's the "information industry."

While the notion of a discrete economic sub-sector called the "information industry" is still not universally accepted, neverthelesss that emerging sector, which includes the software sector, and is often combined with the communications industry, is increasingly being regarded as a strategic sector, especially in the economies of developed and developing countries. Whereas information technology was initially called "IT" technology, increasingly we are seeing "ICT" technologies, wherein information and *communications* are being inseparably integrated into the same products and services, such as telecommunications networks and sub-networks. The Internet itself is, of course, a prime example.

Today, as we enter the 21st Century, we notice that computer and communications hardware and software products are being manufactured at a very great pace, and are spreading throught populations swiftly, pervasively, and at an exponential rate. At the same time, each few years sees a significant decrease in hardware size, a substantial increase in capacity and speed, significant improvements in software versatility, and in the last few years, especially, a dramatic increase in mobility, interconnectivity, and interoperability of the devices.

While dramatically new hardware products often capture the headlines in the popular and trade press, software products are also proliferating, and are improving dramatically in functionality and in offering more and more useful features. They are also extending their utility into more and more fields and sectors, and more and more application areas. Such products and services are more and more being developed not just by Silicon Valley entrepreneurs in the United States, but by well established and highly successful organizations and companies around the world as established and reputable firms notice the obvious and substantial profitability of their younger and smaller, but more mobile, competitors. These developments have occurred with varying success and speed in Egypt, and the other Arab regions, just as they have in North America, Europe, Asia, Africa, and Oceania.

Librarians and other information professionals have contributed actively to the planning, design, development, manufacture, testing, and evaluation of these modern information and communications products and services. It can be said that the traditional skills and expertise of this profession have added information literacy value to those products and services. To mention but a few areas where librarians and information professionals have been intimately involved, we think of:

- Distance Learning;
- Distance Education;
- Search Engines;
- Online Access Tools;
- Online Database Design and Development;
- Computer-assisted indexing and abstracting;
- Knowledge Management (or "Content Management" as it is sometimes called).

In all of these fields, librarians and related information professionals such as archivists, museum curators, records professionals, and information scientists regularly work as instructors and practitioners. It can be fairly asserted, I believe, that collectively, together with computer scientists and communications scientists, they

represent the core profession of the Internet Age. The Internet Age requires a very broad, multi-disciplinary mix of many kinds of professionals.

More germane to this paper, as stated above, information professionals, including librarians, are the profession, which most often is the one responsible for incorporating the information literacy component into the Internet Age products or services, both formally and informally.

As this paper will later address, what is needed is to formalize, systematize, and prioritize the Internet Age public policy strategies, programs, and projects in countries such as Egypt so that attention to the importance of information industry literacy is provided at the very top levels of government. Accountability for achieving those policies, strategies, programs, and projects must be vested clearly in named ministries and named senior officials. Already Egypt is providing top-level national government priority to information and information technology at the ministerial and cabinet level. But, as will be contended, much more remains to be done.

2. SOME USEFUL BASELINE FACTS AND FIGURES ABOUT EGYPT

Since this is a case study involving an entire country, Egypt, it is essential to provide readers with a profile of some key economic and social baseline facts and figures so that the following discussions and analyses will have greater meaning and a clearer context. To that end, here in this section are some key statistics and facts that are particularly relevant (however, stated base year(s) or precise period interval(s) are not always available from government and industry data banks):

- Egypt population in 1993: 60.7 million.
- Growth rate in 1994: 22%.
- GNP/Per Capita Income: USD$ 640.
- GNP Average growth rate: 1.80%.
- Unemployment rate: 15%.
- Main lines for telephones per 100 persons: 5.
- Personal Computers in place: 200.000
- Internet hosts in 1994: 214.
- Internet access in 2001: free for any person in the country.
- The National Library is reactivating its role in national economic development.
- Special libraries: increasing 4% yearly.

A small in-country computer Industry was initially developed based primarily on the manufacture of smaller PC machines, and a fledgling software industry has emerged and achieved some modest success, using Arab-compatible software. The first locally produced compatible PC industry was introduced by the Ministry of Defense, and manufactured by the state owned Banha Electronics Company (BEC) in the 1970s.

In 1980, The Egyptian Government adopted a policy aimed at condensing and concentrating the PC industry. In 1992, the central government procurement office tallied major types of computer hardware as follows: (1)

- 50 % mainframes;
- 40 % minicomputers; and
- 10 % personal computers.

In 1994, the invested capital in PCs alone reached USD$61.8 million, and added 36,350 PC units to the installed base of 194,300 PCs (an increase estimated at 23 %). (2)

The total software market grew to USD$33.5 million in revenues, 55% of which comes from reselling imported software. The local revenues derived from internally (country) developed and in house software was USD$ 15 million (about 25% of which came from exports in 1995). (3)

Programs in support of the country's telecommunications infrastructure have been developed and implemented rapidly over the last 15 years, increasing the telephone line capacity from 510,000 to 3,121,500 units between 1981 and 1994. The United States Agency for International Development (USAID) worked closely in this expansion with the Egyptian National Telephone Monopoly (ARENTO) to improve management and control of communication units and equipment.

Beginning about ten years ago, the Egyptian Customs Authority, in coordination with the Ministry of Communication, centralized control of fax machine purchases. However, today this unusual centralized policy has ceased, and the numbers of fax machines jumped from 374 in 1985 to 25,000 in 1994.

The breakdown of IT sales in Egypt is as follows:

1- IT services 24%.
2- Packaged Software 12%.
3- Data Communications Equipment 5%.
4- Single-User Systems 42%.
5- Multi-User Systems 17%.

The expected Information Technology demand in Egypt up to the year 2005 is expected to be as follows (based on 1998 estimates):

1999 USD$ 50 Million.
2000 USD$ 100 Million.
2001 USD$ 200 Million.
2002 USD$ 400 Million.
2003 USD$ 800 Million.
2004 USD$ 1200 Million.
2005 USD$ 1800 Million.

The expected net increase in the market share for IT will be 47% of the total ITC market.

By the year 2003 "The Technological Valley," as it is sometimes called in Egypt, including "Smart Villages," is expected to increase the national income by USD$2.5 Billion annually, and create at the same time 250,000 new jobs in the manufacturing segment of the IT industries and 50,000 new jobs in the services sector of IT. It is expected that this project will acquire USD$25 Billion in export revenues by the year 2017.
The IT training programs in the country create, yearly, 5000 trained professionals in different IT activities.

The IT market in Egypt during 1997-1999 & 2003 is as follows:

1996	USD$427.3 Million.
1997	USD$515.9 Million.
1998	USD630.3 Million.
1999	USD$1495.3 Million.

2.1 The Egyptian National Information Infrastructure

The term "information infrastructure" has come into use in Egypt to mean the entire array of hardware, software, telecommunications, human, financial, material, and other resources required to support the creation, storage, handling, dissemination, and archiving of a country's data, document, and literature resources (or, more simply, "information resources"), and how those resources are organizationally, physically, and systemically arranged to interconnect and interoperate. Over the last two decades, the utilization of Information and Communications Technology (ICT) has concentrated on a few key factors, such as:

- Dramatic increases in online communications.
- Continued use of offline communications in parallel with online communications.
- New and more powerful hardware and software developments.
- Multi-media production, and the use of interactive, "two way communication" features and functionalities.

In the same period, the human information resources have seen a great proliferation of much more highly trained computer and information technology professionals. These individuals are being trained in the competencies needed to design, plan, install, test, evaluate, and operate all of these new ICT's.

The Egypian information infrastructure, from the standpoint of the aforementioned key factors, contains many successful organizations and highly skilled individuals working in many different information and communications fields. Some of the organizations and individuals are in governmental bodies, some are in private sector establishments, and some are in not-for-profit organizations.

Some of the most prominent of these organizations include :

1. ENSTINET: Egyptian National Scientific & Technical Information Network.
2. NIDOC: National Information & Documentation Center.
3. IDSC: Information and Decision Support Center (Cabinet).
4. RITSEC: Regional Information Technology & Software Engineering Centre.
5. NLE: National Library of Egypt.
6. EUNET: Egyptian Universities Network.
7. Public Libraries: Greater Cairo Public Library, Mubarek Public Library, & Heliopolis Public Library.
8. University Libraries: About 18 university central libraries and branched college libraries.
9. The new Library of Alexandria (Bibliotheca Alexandrina or BA) with its unique worldwide role in information literacy.

Many of these principal organizations are considered governmental bodies. But it must also be stressed that private sector organizations have begun to play an active role in the information fields, specially the

sophisticated activities, and in information industry activities. And in some cases, we are seeing the emergence of the newer "civil society" hybrid of mixed public-private sector organizations, which can be more effective than organizations in either sector operating singly, or in more traditional collaborative organizational formats such as simple partnerships.

In the decade 1990 to 1999, the real "revolution of information" began in Egypt, specifically after the Egyptian First Lady led an aggressive and quite strong personal campaign to stress the importance of the new technologies to Egypt, on a fairly regular basis.

Also, these key aforementioned information and communication organizations , both governmental and private, began to concentrate on three key "angles" in their projects (in Western parlance the phrase "strategic success factors" is more common):

1- <u>The Theoretical Angle</u>: covering computer software development, the application of knowledge engineering tools and techniques, and the extension and expansion of applications development;

2- <u>The Practical Angle</u>: covering the pervasive spread of computer and network technologies and facilities in all sectors of the Egyptian economy and society, publishing using the newer and more versatile mediums and formats, and both electronic and pre-electronic (i.e. print, microfiche) collections development; and

3- <u>The Human Angle</u>: covering the programs and curriculums for education and training of the required workforce that would populate the emerging Egyptian information industry.

The main features of these dramatic strategies can be highlighted by the following chronogram:

<u>Base Year</u>	<u>Key Milestones</u>
-1992	The distribution of hardware was 50 % mainframes, 40 % minicomputers, and 10 % PC's
-1994	The invested capital in the PC hardware market jumped to $ 61.8 million
-1995	Statistics showed 230,650 installed computers
-1998	Trends reflected a 23% increase in computer units in just three years since the 1995 statistics were compiled
-1998	The Software market grew to $ 33.5 Million in revenue
-1998	Fifty-Five percent of computer industry revenues came from reselling imported software
-1999	The revenues realized from locally developed or in house developed software was $15 million or about 75% of the total revenues generated, whereas 25% of the revenues came from exports

-1999	Very significant iimprovements in the country's telecommunications infrastructure were implemented and realized just over the last 15 Years

-1999   Telephone capacity increased from 510,000 to 3,123,500 lines between 1981 and 1994

-1999   The USAID & ARENTO (The Egyptian   National Telephone Monopoly) significantly improved telephone operations - USAID funded; these improvements included more lines, new switching centers, and a central national operating center

-1999   The number of fax installations jumped from 374 to 25000 from 1986 to 1994

-2001 & 2002   Implementation of a one million-telephone line goal to be achieved based on a 5-year plan

- Start of a satellite communication system to support a 500 public telephone system network

- The public policy announcement of making Internet access free for any citizen, (notably, the first country in the, Middle East to do this, the numbers of Internet users jump to 3 million subscribers (10)

- The investment in ICT in 2002 is 3.5 billion Egyptian pound

- Telephone subscribers increased to 6.5 million subscribers

- Mobile telephones grew from 877,000 in 1998 to 2.5 million in March 2001. The five years plan will reach 12 million subscriber on 2005

- The government has announced the start of highly visible national information services programs, in such areas as an E-Commerce program, an integrated financial information system for the entire country, a medical information services program, an E-Government program, creating new culture & heritage databases, including:

    The Archeological Map of Egypt.
    Cairo Architectural Heritage.
    The National Heritage Program.
    The Musical Heritage Program.
    The Egyptian Folklore.
    The Photographic Heritage of Egypt.

These dates and figures give some broad trends and indications in the evolution of the Egyptian information industry. (8)

2.2 Education and Research

The yearly budget per student comes to USD$170 (still very weak compared to Israel USD$3500, Europe USD$5000, and the USA USD$8000). But in the last few years there has been rapid movement to increase the country's education and research budget, including the creation of modern new facilities to support the traditional education and research processes, such as distance education and distance learning facilities and institutions:

Here are some key facts and figures.

- Seven new university faculties for IT were established from 1995 to 2001
- A 7 year program (from 1997 to 2003) is creating annually 5000 trainees in IT activities
- Computers and Internet access are being provided in 20,000 schools at all levels of education
- 21st Century clubs for children are being established in key villages and rural communities (part of the "Smart Villages" idea)
- Specialized information centers have grown to over 1400 in all scientific and technological activities
- IT companies have grown from 426 companies in 1996 to 747 in 2000
- "The Smart Village" program has been established, wherein the government supplies the land and facilities equal to 20% in value for any given project and the balance is provided by the private sector
- A union law for participating in information activities is being developed

3. THE ROLE OF INFORMATION ORGANIZATIONS IN EGYPT

Having provided some general statistical data intended to illustrate how the pervasive and dramatic spread of IT throughout all sectors of the Egyptian economy and society has impacted the country in very significant, and irreversible ways, we will now discuss the role of the various information organizations and institutions. (1)

- o RITSEC (Regional Information Technology and Software Engineering Center). This is a very important umbrella organization that is concerned with promoting networking, software development, and the education of   computer professionals through conferences and training programs. It also has mounted a World Wide Web site that identifies various accessible information technology services. The following subordinate bodies operate under RITSEC's umbrella:
    - IDSC (Information and Decision Support Center) (Cabinet level agency). This is RITSEC's main body and is considered the leading organization in Egypt for identifying, promoting, and evaluating information technology applications.
    - Installed computerized branches of IDSC (27 branch offices of IDSC have been established in 27 govern orates to assist high-level of decision making operations. (9)
- o ESTINET & EUNET: The main information services body in The Academy of Scientific Research. Its main functions, since 1980, have been to: provide the technical community with a document delivery system (DDC); to provide a full Internet service, including e-mail, Gophers, and eight WWW servers at Cairo University. Internet connectivity is via a 64 KBPS leased line to Montpelier in France. On July 1995, there were 214 registered Internet hosts in Egypt, which is a 311% increase since 1994.

4. THE IMPACTS OF THE INTERNET AGE ON EGYPTIAN SOCIETY

As inferred by the facts and figures put forward in preceding sections, during the last decade, especially, Egypt has achieved a significant level of information and information technology investment and application, primarily due to the strong support from Government and university based networks. Although the development is not moving as fast as initially expected, especially in rural areas, the upgraded and modernized Egyptian information infrastructure is considered one of the strongest in the region. The impacts of this greatly strengthened information infrastructure are extensive, and we will examine some of the more noteworthy here.

It should be remembered that Egypt has the largest population in the Arab World, and also has the largest educated manpower sector (post secondary & university communities). It also has the highest teledensity (i.e. access to telecommunications facilities) in North Africa – 5%. But at the same time, the country has the lowest GNP per Capita in the region.

As indicated earlier, key Egyptian information institutions and organizations, such as IDSC, RITSEC, & ESTINET, designed and implemented many of the most important information projects within the framework of the overall government strategy and policy mentioned above. (4)

The experience in implementing a data communication program demonstrated and underscored the reliability of skilled Egyptian manpower. These professionals established and maintained a trouble-shooting capability for detecting and rapidly solving problems encountered in the operation of telecommunications and electronic networks. The Egyptian National Network provides online services to 10 universities, dozens of institutions and official Public Authorities, plus 2400 schools. (5)

The newest Government information and information technology projects are:(11)

1. The "Government Online" project which aims to enhance all ministry information infrastructures, and create an integrated national information network for the ministries, linked to the Cabinet Information Decision Support Center (IDSC).

2. The "Integrated Network" project aims to incorporate the information resources into various decision support centers serving 26 govern orates.

3. The "National Database for Legislation" project aims to build an integrated database containing Egyptian codes and decrees with daily updates, including legislation enacted from 1828 until the present time.

4. The "National ID" project which intends to provide a national ID for all Egyptians, and involves building a database including birth, death, marriage, and divorce cases since 1900 to the present.

5. The "Human Resources Development" program, which aims to develop highly, qualified Egyptian human resources capable of producing Egyptian IT technologies.

6. The "Tourism National Network" Program, which aims to increase tourism revenues, and market Egypt as a tourist region globally.

7. The "Health National Network" program, which aims to improve health services.

8. The "Banking Services Development" program, which aims to increase the level of automation in the banking sector.

5. LIBRARY AND PUBLISHING INDUSTRY IN EGYPT

A. Recent challenges of libraries in Egypt

The following indications represent the current infrastructure of libraries in Egypt, and its rapid developments:

1. Development of the National Library, started from one year ago and finished last month.
2. Establish new four Public Libraries, some of them are very sophisticated in functions and implementing developed IT.
3. 18 Central University Libraries, Plus about 320 College Libraries.
4. About 3500 Special Libraries.
5. 22000 School Libraries. (6)

B. The National Bibliography of Egypt (NBE)

The NLE (National Library of Egypt) And ACML (Alexandria Centre for Multimedia & Libraries) cooperated to mount a very important project to develop a database for the "Legal Deposit products and load it on CD-ROM. (7) The Project is still in its planning stages, and is expected to be launched very soon.

C. The Revival of Public Libraries in Egypt

A new and well-organized public library was created under the name "GREAT CAIRO PUBLIC LIBRARY" (GCPL). Its holdings are extensive and have grown significantly.

6. ROLE OF THE BIBLIOTHECA ALEXANDRINA IN WORLD INFORMATION LITERACY

A. Modern Revival of Alexandria Library

In 1998, the Egyptian government, in cooperation with UNESCO, announced plans to "revive the ancient Bibliotheca Alexandrina by restating its universal legacy in modern terms."   In the presence of heads of state assembled at Aswan on the Nile, an international appeal for funds was launched to build a new Library in Alexandria, on the site of the old one, in a building of contemporary design.

The first objective was to assemble collections of works likely to have been contained in the Ptolemaic Library. But the purpose behind the objective is *revival*, not *restoration*, of the ancient institution as a "temple of learning."   The revived institution will focus mainly on the history, geography and culture of the eastern Mediterranean world and the Near East. Special emphasis will be put on Greek and Egyptian civilizations, Coptic Christianity and the heritage of Islam. The basic collections in the history of science and medicine in the

present library of the University of Alexandria will be expanded and added to the new institution. Subsequently, each of the world's governments will be invited to donate a selection of books.

A new conceptual challenge for Library and Information Science was posed by the revival of Alexandrina by many of the experts who early on visited the project and prepared various studies on its roles and programs, and who thought that a new idea defining and explaining the role of Alexandrina as a World Academic Public Library was needed. Although both academic libraries and public libraries are well established concepts, the idea of mixing the two together in a new institutional role is novel at the world level, although a number of countries are beginning to experiment with this idea where universities have important collections and services that could be utilized to support public, not just academic needs.

The reason for this concept and term is closely related to the fact that Alexandrina's expected primary user would be the Alexandria University with its 40,000 teaching staff and 150,000 students. Therefore, the term was created. In brief, Alexandrina will serve the role of not just a public library and not just an academic library, but a mixture of the two.

Since the primary role of all libraries is to disseminate information, Alexandrina will have a modern printing facility with orthographies of Hieroglyphic, Greek, Latin, Hebrew, Coptic, Arabic and other languages, as well as photographic services, and assembly rooms for major international congresses. It will also house a centre for the conservation of the thousands of manuscripts threatened with destruction held by Egyptian monasteries, mosques and museums.

With the heritage of the Ptolemies as its inspiration, the new Library of Alexandria will attempt, according to its charter, to build a sum of knowledge embracing "the writings of all peoples." But unlike its ancient ancestor, the Library will join the international information networks, with information stored in a database accessible to researchers all over the world. Plans also call for the establishment of a school of information sciences.

Ptolemy Soter's order at the end of the fourth century B.C. to "collect all books in the world" is now echoed at the end of the twentieth century A.D. by the call to collect "the writings of all peoples." To this end, the new Library of Alexandria will continue the legacy of the old: to assemble and preserve the record of the totality of human achievement.

The Alexandrina Bibliotheca is expected to officially open on the 23rd of April 2002, although the library has been informally open since October 2001.

B. How the Library's Role and Its Programs Relate to World Information Literacy

The Alexandrina Bibliotheca relates to information literacy in the following respects.

a- The Library is expected to play a key role in serving as a center of excellence to help plan reforms in the Library and Information schools curriculums worldwide, by convening meetings of curriculum reform experts and educators.

b- Alexandrina will play a role of assisting information transfer between Egypt and the corresponding information resources outside Egypt.

c- Alexandrina will play a leadership role for the whole community of Egyptian libraries in:
  -Professional activities.
  -Library services.
  -Library networking.
  -Document delivery and Inter library Loan (ILL).

d- Alexandrina will convene many congresses, seminars, meetings, workshops, and so on, on many different scientific, technological, business and industry, socio-culture, and other topics.

7. RESULTS & CONCLUSIONS

Egypt is certainly moving rapidly to introduce modern information and communications technologies into all sectors of its economy and its society. However, this rapid movement is still not fast enough to fully exploit all of the technologies as they are introduced into the marketplace because new technologies are being developed almost daily. Full exploitation of state-of-the-art information and communications technologies depends in large part on the information industry literacy level of an elite cadre of skilled information professionals who are sensitive to business and industry applications, not just applications in the scientific, governmental, and social sectors. This need to train an elite cadre of information professionals who are highly information industry literate and who are sensitive to the needs of all political, economic, and socio-cultural sectors, must be the foundation on which comprehensive Egyptian Internet Age plans, programs and policies are based. The human factor, in short, remains the most challenging component in Egypt's development plans for the future.

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